CQ-TV MAGAZINE No. 114

BRITISH AMATEUR TELEVISION CLUB

MAY 1981

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ENROLMENT FEE 50p. This applies also to persons re-joining the club after an elapsed subscription. FULL YEAR £3. April to December £2.25p. July to December £1.50p. October to December 75p. All subscriptions fall due on the first of January each year. Overseas applicants should not send foreign cheques please.

Editorial

Have you noticed how crowded 70cm has become lately? I was chatting the other day to a bunch of local TVers about how the band used to be. "Quiet" said one, "silent" said another, "like the grave" agreed a third. It was quite an event to work a TV station and QRM was unheard of. 'Bliss' you might think, not a bit of it, you had to be dedicated to stay the course. Those days (happily) are well and truly gone, there are far more active TVers now than at any time in the past and during contests and openings the QRM is beyond belief. During the last lift for example I was trying to copy a distant station and managed to identify no less than five different amateur pictures on the screen at the same time! Then what about repeaters? Those things are springing up all over the place and wreaking havoc with ATV DXing. 70cm simplex and SSB working are also on the up, especially now that there are lots of shiny Japanese black boxes available. "Whats he leading up to?" Well, it seems that all the signs point to an increasing need to find other frequencies to use for ATV. The most obvious of course is 23cm. Not that I'm suggesting for a moment that we allow ourselves to be squeezed off 70cm but even if only to relieve the congestion we sometimes cause to ourselves, it would seem that an alternative band is becoming necessary.

There is certainly a nice bit of room up there, the band plan gives ATV from about 1262 MHz to 1283 MHz. That's besides TV repeater allocations. One could then use full inter-carrier sound and still leave room for other users. Equipment would seem at first glance to be a stumbling block, but there are moves afoot to rectify this problem and you should see a noticeable increase in 23cm material in this magazine over the next few issues.

This is not an attempt to get everyone on 23cm (I'm not on the band myself), but just to point out how things are shaping up and to suggest that the subject be given some thought and discussion, after all you can't stop progress and 23cm is coming as sure as this editorial is at an end.

John L. Wood. G3YQC

CONTENTS

CLOSE FOR PRESS DATE FOR THE AUGUST ISSUE.....20th June 1981.

EDITORS POSTBAG

Dear ED.

Just a few lines to say that since I started on ATV and joining in QSOs on 144.75 MHz, I am very impressed with the help and friendliness that I have received. I would like to thank G3YQC, G4DYP and G8VBC for the many hours they have given in helping me to get on the air.

With the growing number of new stations coming onto ATV I can only hope that the friendly and gentlemanly atmosphere will be maintained.

Yours with thanks,
M.Beddow, G8VBC
Coventry.

Dear ED.

The ATV scene down here in Melbourne is very active, the latest addition being a repeater, (440 MHz in-579 MHz out) which provides excellent coverage of the metropolitan area. Signals are of a very high standard and technical broadcasts are a regular weekly feature. A local amateur radio magazine is presently preparing a series of articles on the repeater, so once they are available I will forward you a copy as I'm sure it would be of interest to the chaps over there.

On the home front I am presently working on a monochrome camera based on the "Practical Wireless" design, which, with a bit of luck I should have working in the near future and at long last be an active member of the A5 clan.

K. Prendergast, VK8ZKD
Victoria.

Dear ED.

Firstly, well done on producing two excellent editions of CQ-TV. Being a new member of the club I do not pretend to understand all the contents but the general layout seems good.

In CQ-TV 113 you asked for some members to write to you and tell you what they were doing. Well, I am in my sixth year at school studying CSYS physics. Within the curriculum is a project which is worth 50% in my final mark and since I am interested in electronics I decided to devote the project to SSTV. I had never heard of it before but my teacher, Peter Bates, made it sound too good to miss.

So far it's been great. Basically what I do is to build a circuit and use a signal generator as the input. I monitor both input and output on a double-beam 'scope. I keep the input constant and convert the input/ output into a dB scale. I then plot a graph of dB against frequency, and can then determine various characteristics of the circuit.

The actual monitor I am building is the W6MXV/W9HWX design. The book I use is 'Slow Scan Television' by Don Miller & Ralph Taggart. I find the book very good.

So far I have built two limiters, a monostable multivibrator, two low pass filters, a 1200Hz active bandpass filter and a sync detector circuit. So far everything is working fine. I have been given an SSTV test tape by Grant Dixon and this has been very helpful.

Stuart Maclaren.
Edinburgh.

G4DYP TV TRANSMITTER

John Hopkins. G4DYP.

This unit was designed as a low power high quality 70cm television transmitter which is capable of producing well in excess of 100mW peak sync and can be used either as a QRP transmitter for local or portable working or as a driver for a higher power linear amplifier.

The transmitter has been well tried and tested on the air with several units in regular use and, needing no special printed circuit board is easy to construct and operate.

When correctly tuned and adjusted the transmitter will handle a video signal having a bandwidth of greater than 6MHz and is therefore adequate for colour transmissions as well as black and white.

All components used in this design are common types and readily obtainable.

CIRCUIT DESCRIPTION.

The RF stages of this transmitter follow conventional practice. A crystal oscillator of around 72.5MHz drives T2 which acts as a tripler. The resulting 217MHz signal is doubled in T3 which uses a BFY90 transistor and the 70cm signal is coupled to the first amplifier T4.

Both BFY90 amplifiers T4 and T5 receive modulation principly on their bases, in practice this was found to work better than applying modulation to the collectors only. The depth of modulation and the RF output level is controlled by the 47K pre-set resistor in the base circuit of T4. Since both stages have video signals on their supply rails decoupling is kept to a minimum to reduce any restriction of the video bandwidth.

The modulated 70cm signal is finally passed via C5 to the linear amplifier T6 which raises the level to 100mW or so. The network L6, C6 and C7 matches the amplifier to a 50 ohm load.

A standard video signal (1v p-p) is applied to the video input, video gain is set by a 100 ohm carbon potentiometer which may be panel mounted. An RC Pi-network helps to keep RF out of the modulator. The OA91 diode provides DC restoration and is connected to a pre-set resistor which sets the DC output voltage of the modulator which provides the 11v supply rail to the modulated RF stages.

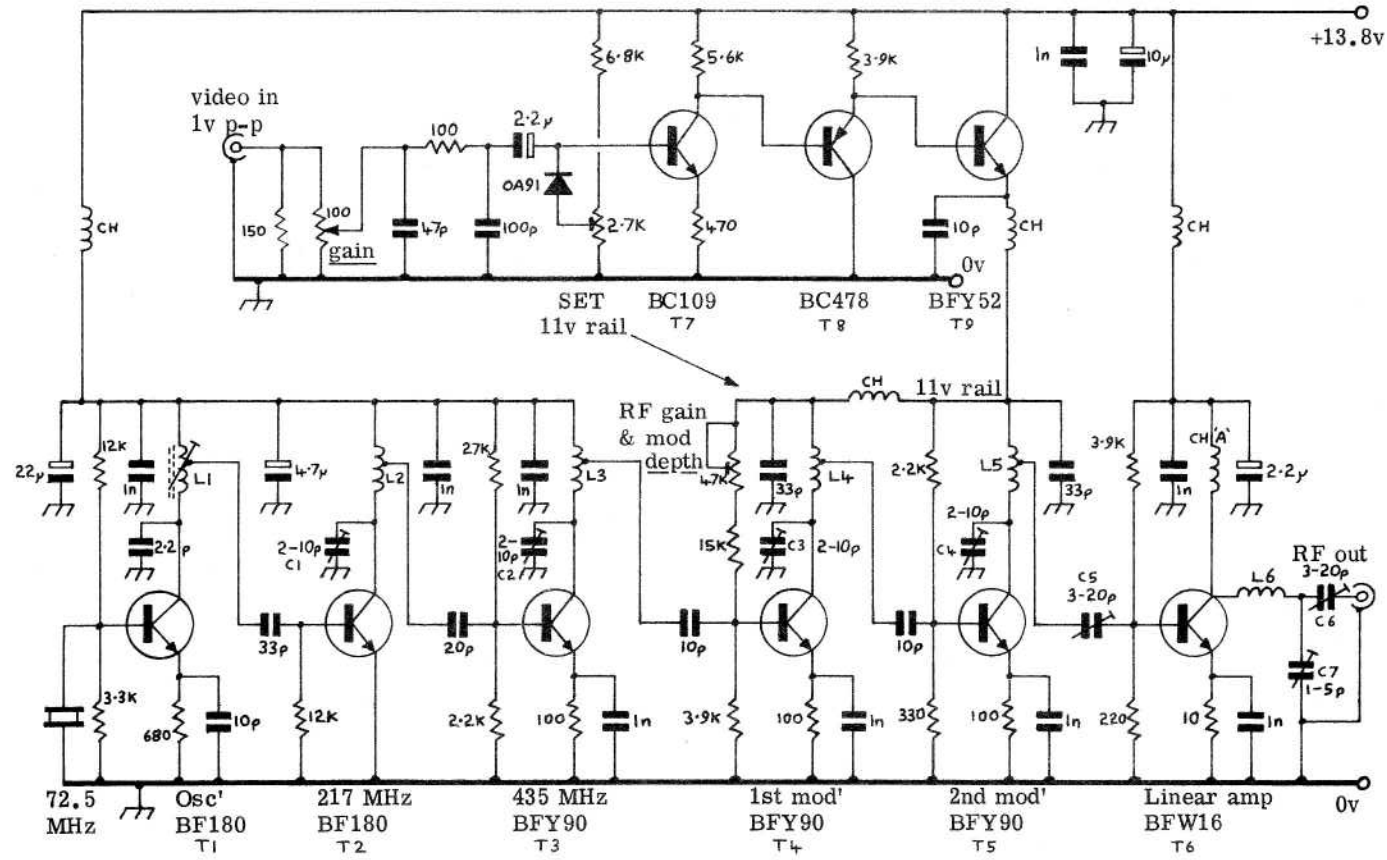


Fig 1 G4DYP 100mW VIDEO TRANSMITTER.

COMPONENTS.

All capacitors should be good quality disc or tubular ceramic types. Electrolytics should be at least 16v working. Trimmer capacitors should be plastic film types. All resistors are $\frac{1}{4}$W except where otherwise stated.

CONSTRUCTION.

Although printed circuit techniques are used to ensure repeatability it is not necessary to etch and drill a conventional PCB.

Take a piece of single-sided copper laminated board 4 7/8" x 1 5/8" and place it copper side uppermost, from a similar piece of board cut out the pads indicated by the shaded areas in Fig.2 using a small saw. Glue these pieces copper side up with 'instant' glue to the main board in the positions shown. The size of the pads are kept as small as practicable especially those associated with the tuned circuits. Too large a pad may mean that the circuit will not tune correctly.

All RF de-coupling capacitors should be wired in such a way that their leads are as short as possible, this is most important for stable operation. The emitter components of T3, 4, 5 and 6 should be wired as shown in Fig. 2 keeping leads very short. The 100 ohm emitter resistors for T3, 4 and 5 should be 1/8W if possible since these are shorter than the usual $\frac{1}{4}$W types.

The layout shown in Fig. 2 should be followed as closely as possible and dimensions are given to assist in the correct positioning of the pads.

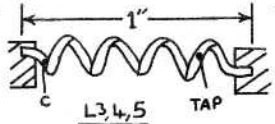
ALIGNMENT.

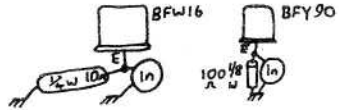
Lift the chokes from the supply rails to T4, 5 and 6. Apply 13.8v to the transmitter and adjust L1 until the oscillator starts, switch the transmitter on and off a few times to ensure reliable starting every time. Tune C1, L2 to 217MHz and C2, L3 to 435MHz. Output frequencies should be checked with an absorbtion wavemeter. Re-connect the chokes to T4 and 5 and, with no video input applied, adjust the 2.7k pre-set resistor in the modulator for +11v on the 11v rail. Tune C3, L4 and C4, L5 to 435MHz. Check that the 11v rail is still correct and re-adjust if necessary.

Connect a 50 ohm load to the RF out socket and apply 13.8v to T6 by re-connecting its choke. Adjust the network L6, C6, C7 for maximum RF output which should be in excess of 100mW. Adjust C5 for correct power output. RF output should also be adjustable with the RF gain control.

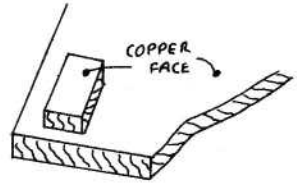
Apply video and advance the video gain control. The RF output, when measured on an average reading power meter will drop and will read around half the peak reading when a good depth of modulation is present. Monitor the RF signal using a de-modulator probe and adjust the video gain, RF gain and C5 for an undistorted picture viewed on a monitor or oscilloscope.

L1. 15t 30swg on 3/16" former with core.
L2. 4t 22swg 3/16" id, 5/16" long.
L3, 4, 5. 4t 22swg 1/8" id 1" long.
L6. 3t 20swg 9/32" id 1" long.
L1, tap 4t from supply end.
All others tap 1t from supply end.
CH. 10t 30swg 1/8" dia.
CH'A'. 4t 20swg 1/8" id 1/4" long.





Detail of emitter components on high frequency transistors.



Fitting pads to copper clad board with instant glue.

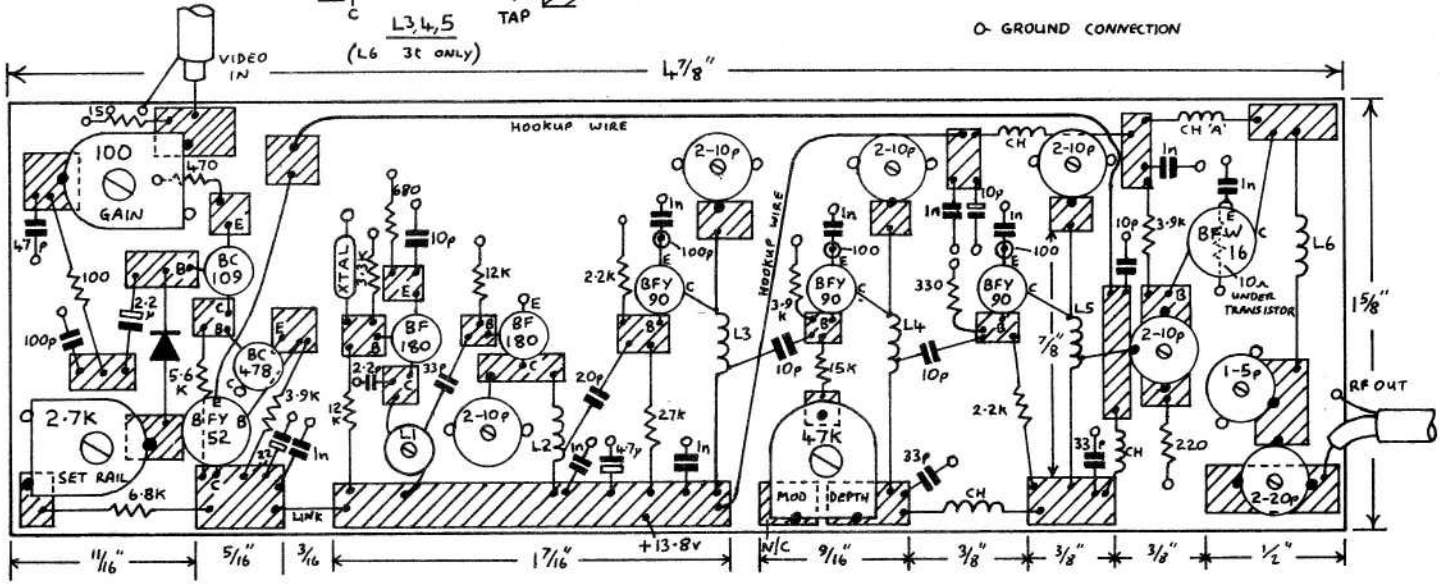


Fig 2 CONSTRUCTIONAL LAYOUT.

To get the absolute maximum from the transmitter the biassing of the amplifier transistors may be adjusted to suit the particular transistors used. The BFY90 transistors should have a quiescent current of around 2mA with the oscillator crystal removed whilst the BFW16 should have around 4mA.

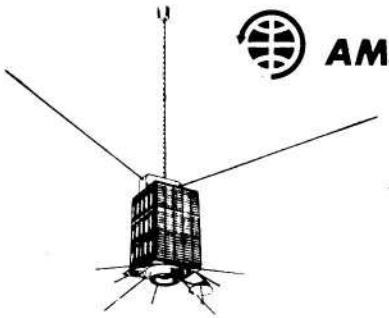
If there is insufficient depth of modulation the 15k bias resistor in the base circuit of T4 may be reduced. To ensure adequate video gain a 'good' BC109 should be used for T7, preferably with the suffix B or C.

CONCLUSIONS.

Several transmitters have been constructed to this design and the only problems encountered were due to faulty or unsuitable components, long decoupling capacitor leads or the use of different transistors from those specified.

The next issue of CQ-TV will give details of a range of transistorised linear amplifiers with various output powers up to 20W. The amplifiers are designed to be driven from this 100mW transmitter.

The BFW16 transistors are available from A.J.H. Electronics, Rugby. and from J.Birkett. The BFY90s are widely available but Sendz Components, 63 Bishopsteignton, Shoeburyness, Essex, SS3 8AF are currently offering them for 15p each.



AMSAT

SSTV SATELLITE

The following item is taken from the Feb. 1981 UOSAT newsletter by Dr. M.N.Sweeting - Project Manager UOSAT, Dept. of Electronics and Electrical Engineering, University of Surrey.

Britains first amateur satellite - UOSAT - under construction at the University of Surrey is now entering the final stages before launch into polar earth orbit. UOSAT is currently scheduled for launch on a NASA Delta 2310 (two stage + three solid castor - 11 booster), accompanying a Solar Mesosphere Explorer spacecraft, at 11:19 GMT on 15 September 1981 from the Western Test Range at Vandenberg, California, USA. The programmed orbital elements are as follows;

Altitude: 530km Inclination: 97.5 degrees
Period: 98 minutes 3 pm descending node
Seperation from the Delta vehicle should occur at 12.30 GMT over the Sudan, N. Africa assuming a nominal launch.

DATA BEACONS.

Two VHF/UHF beacons provide the primary engineering and experiment data links to the outside world and have been designed to provide a healthy satellite-to-ground transmission link to enable reliable and straight forward reception by the simplest of amateur ground stations. A standard unmodified n.b.f.m. amateur receiver and a small, fixed pair of crossed-dipoles should suffice for most orbit passes. The data sources available to these beacons are:

Telemetry - ASCII - Baudot - Morse Code
S/C Computer - Primary o/p Port - Secondary o/p Port - Speech Synthesiser
Earth Imaging Experiment - Image Data (SSTV)

GENERAL DATA BEACON.

Frequency:	145.825 MHz	Power output:	450 mW
Modulation:	n.b.f.m./c.w.	Efficiency (total dc/rf):	45%
Data format:	A.F.S.K. (n.b.f.m.)		

ENGINEERING DATA BEACON.

Frequency:	435.025 MHz	Power output:	400 mW
Modulation:	n.b.f.m./c.w.	Efficiency (dc/rf):	40%
Data format:	A.F.S.K. (n.b.f.m.)		

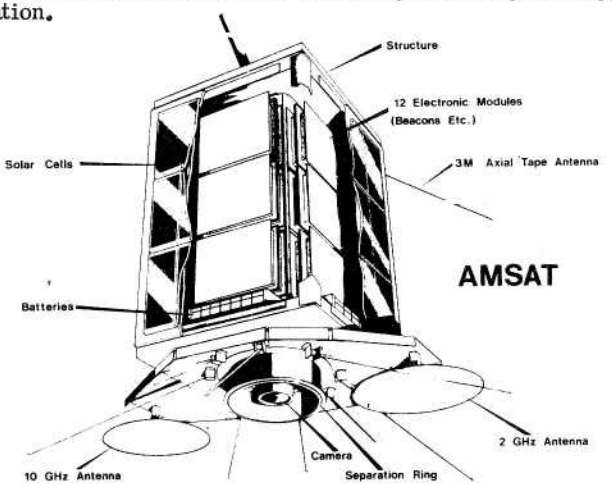
Phase-referenced beacons on 7.001, 14.001, 21.001 and 28.001 MHz will support a wide range of ionospheric experiments and observations, whilst two microwave beacons on 2.401 GHz and 10.470 GHz will encourage the study of SHF propagation and the development of inexpensive microwave satellite Ground Stations.

SLOW - SCAN TV.

An earth - pointing, solid - state charge - coupled - device, two dimensional imaging array will provide land and sea image data for digital transmission via the General Data Beacon, using minimum - shift a.f.s.k. at 1200 b.p.s. line synchronous. The image format is 256 x 256 pixcels with 16 grey levels and is stored in an on - board 0.25 M-bit solid - state memory. The camera optics are organised to cover a 500 km x 500 km area of the earth's surface yielding a resolution of around 2 km. The response of the camera is optimised to enhance land features and land/sea boundaries. This experiment can also be used to display processed telemetry and experiment data in graphical form from the on - board computer. Circuits and full details for the necessary ground receiving and display equipment (using a domestic TV) will be published later this year - component cost around £100. The BATC ar hoping to make available suitable printed circuit boards for this receive system. Details will be announced at a later date.

A digitally synthesised speech experiment module under the control of the spacecraft computer will "speak" telemetry, experiment data and spacecraft 'news' with a limited vocabulary for use with school demonstrations of space sciences. The 'speech' (in English) can be transmitted in n.b.f.m. on either of the Data beacons.

Our thanks to Dr. Sweeting and the University of Surrey for supplying the above information.



CIRCUIT NOTEBOOK

IT'S BACK!

No. 29

by John Lawrence, GW3JGA

A 'PRETTY' COLOUR GENERATOR.

After a break of three years, due to domestic committments, circuit notebook returns to CQ-TV. For the information of new members, the purpose of this column is to put forward ideas and circuits having applications in amateur TV. The sources may be from manufacturers application notes, various technical publications or from ideas passed on by other ATV enthusiasts.

The GW (North Wales) display at the last BATC convention included a PAL colour coder by GW8PBX details of which appear in the new BATC 'Amateur Television Handbook'. To demonstrate the capabilities of the coder, the GW3JGA 'pretty colour' generator was breadboarded to provide a suitable R.G.B. test signal. This is how it works:

A clock oscillator, running at about 0.5Hz is divided by 2 to give a 0.25Hz square wave which drives three J-K flip-flops connected to provide 3 phase outputs. The 3 phase square-wave outputs, representing red, green and blue signals are fed to three simple Miller integrators. The 'ramping' output of each integrator provides a smoothly changing 3 phase sequence as shown in Fig.1.

To define a zero level, for signal processing purposes, the output of each integrator is blanked with mixed blanking pulses and fed to three simple emitter follower stages to provide 0.7v p-p R.G.B. video into 75 ohms. Suitable for feeding to the GW8PBX PAL coder!

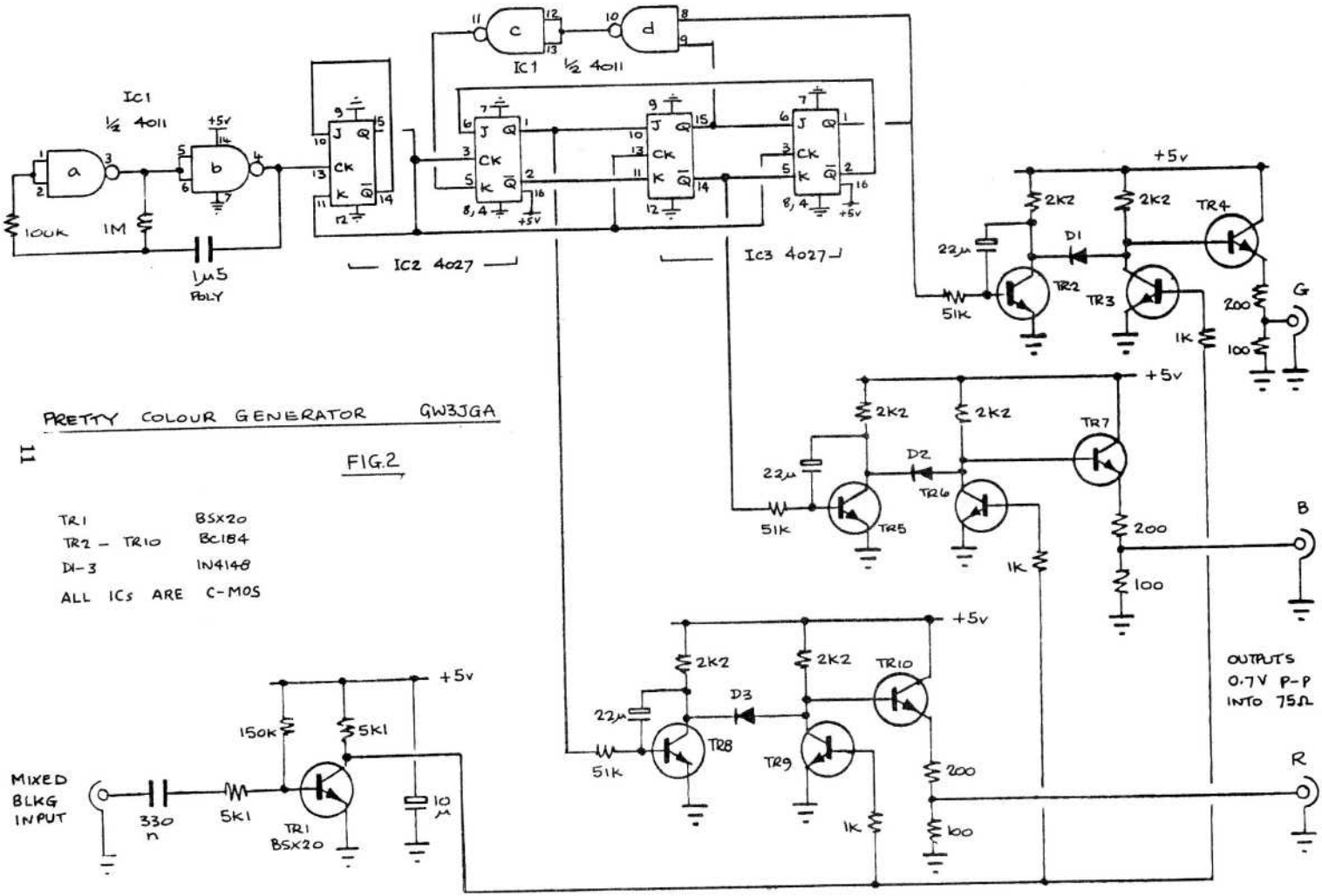
The generator provides a constantly changing colour sequence and with your callsign inserted into the display it provides a useful alternative colour signal.

REFERENCES.

Astable & Monostable oscillators using RCA COS/MOS. RCA application report ICAN-6267. Free from Semicomps Northern Ltd., East Bowmont Street, Kelso, Roxburghshire.

Johnson Counters. Wireless World Circard, set 14 number 3.

Counters. Texas Instruments application report CA102.



PRETTY COLOUR GENERATOR GW3JGA

FIG.2

TR1	BSX20
TR2 – TR10	BC184
D1-3	IN4148

ALL ICs ARE C-MOS

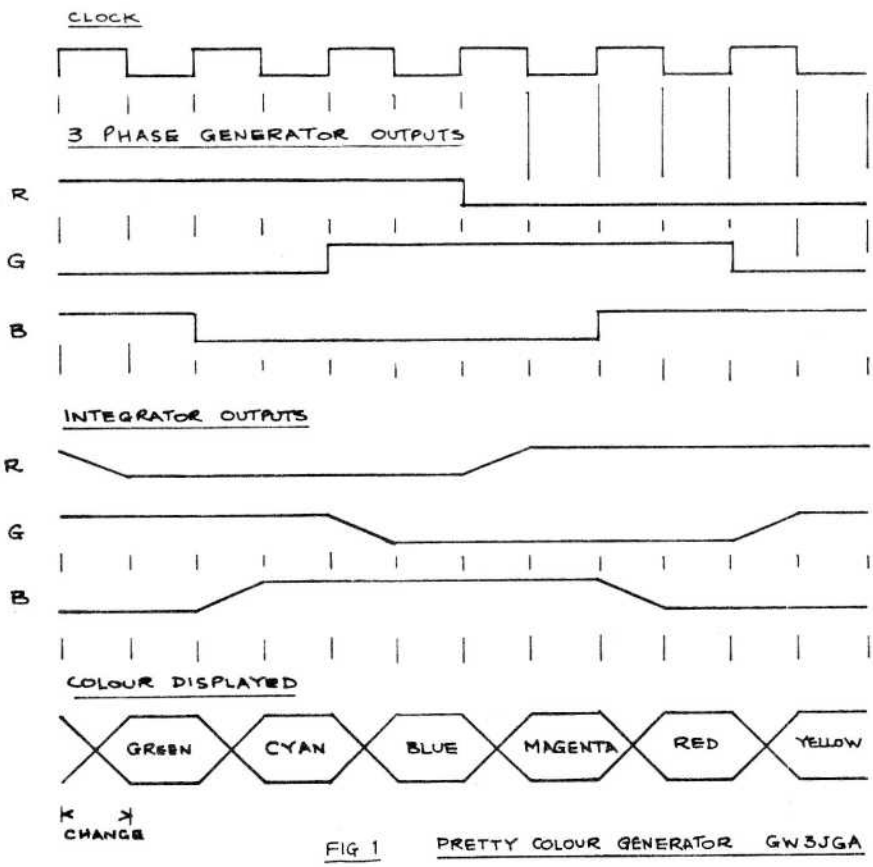


FIG 1 PRETTY COLOUR GENERATOR GW3JGA

MIDLANDS VHF CONVENTION 1981

The BATC hope to have a stand at the next Midlands VHF convention which is to be held in October. Tickets will be available in advance and further details will be published in the next issue of this magazine.

CONTEST NEWS

I am pleased to be able to report that the full results for the International ATV contest held in September last year are now to hand and these are listed below.

As you will see over 100 stations put in entries for the 70cm section of the contest, there were 15 entries on 23cm and even 3 entries on 3cm. This would indicate that there must have been over 300 stations actually active in Europe during the contest and this compares more than favourably with the normal phone and CW contests on these bands. Obviously our congratulations must go to Marc, F3YX for achieving his incredible score of nearly 17,000 points, the QRM level in France must be unbelievable. Our congratulations also go to G8MNY for being first in the UK .

Unfortunately I did not receive any entries for the slow scan contest in November, so I can only assume that the level of interest in such contests has reached an all time low. Perhaps those who are active could let me know what sort of contest would actually get them on the air!

Finally, an advanced warning that the next international ATV contest is on the 12/13th September 1981.

73, Graham Shirville G3VZV

INTERNATIONAL ATV CONTEST 1980

70cm SECTION.

Posn	Call	Points	Best DX (km)	Posn	Call	Points	Best DX (km)
1	F3YX	16972	384	15	F1DKC	2674	
2	F6BEZ	11858		16	F1AJD	2330	
3	F6EBJ	9140		17	G8MNY/P	2078	147
4	F6CHU	8980		18	PA0GB	2007	165
5	F8MM	8190		19	FiEJK	1941	
6	ON5ID	5859	246	20	F1CRG	1916	
7	ON6UG	5410	266	21	F1ANW	1914	
8	F2RI	5360		22	F6EIF	1786	
9	F1ETG	5269		23	DJ4LB/A	1544	128
10	F1AGO	5160		24	ON6PM/T	1521	111
11	F6BGR	4366		25	PA2AAD/A	1486	95
11	F9CH	4366		26	F1ZI	1461	
13	F6CMB	3074		27	DC4BO	1454	110
14	F1BJB	2721		28	ON7FI	1407	244

70cm section (continued)

Posn	Call	Points	Best DX (km)	Posn	Call	Points	Best DX (km)
29	G8SCG/P	1382	176	66	G8HBR/P	467	103
30	ON5VG	1313	77	67	PE1AME	460	46
31	ON5KO	1203	251	68	PA0BOJ	455	62
32	ON1JE	1199	73	69	F6FGE	452	
33	PE1CSI/A	1192	98	70	F1FRG	449	
34	DC6CF	1174	90	71	DK8CD	439	70
35	G4CRJ	1159	365	72	DC1MP	411	75
36	F5AD	1114		73	DK3QA	398	80
37	G4DYP	1094	135	74	PE0KGF	394	62
38	F3LP	1080		75	G4IMO	390	85
39	DK0PX	1038	144	76	ON1RG	375	44
40	DK4MM/A	1032	107	77	F6FHH	366	
41	DL1LS	1028	141	78	DC4CK	358	38
41	DB6II	1028	141	79	PE1BFD	351	25
43	G8EGG	1024	63	80	DB8SB	318	63
44	G3YQC	994	145	81	F1DKW	294	
45	G8IWX	980	94	82	G8SUY	290	38
46	DL0OD	889	60	83	G8PTH	281	40
47	G8VBC	819	160	84	PE1DTS	262	52
48	F6GKQ	789		85	DK0NF	250	35
49	PA0ERW	754	83	86	PA0TVJ	242	34
50	F3HD	745		87	DJ8NC	238	60
51	F1ETD	712		88	PE1CME	231	29
52	G8OVX/P	703	63	89	PE1CWF	226	14
53	DL6FAT	670	93	90	PE1BZL	168	23
54	DD0YR	648	103	91	DL5NQ	149	21
55	DJ8EW	636	59	92	G8FNR	126	39
56	DK2DB	596	108	92	G8GLQ	126	39
57	PA0AWI	561	68	94	F1ERJ	96	
58	ON5NK	549	56	95	G8KGH	94	39
59	F6ELI	519		96	DF2SS	60	15
60	G8EIM	513	63	97	PA0AOG	46	18
61	G4BVK/P	506	104	98	PA0HMV	34	17
62	G8DLX	494	172	98	PA0JKW	34	18
63	F3RP	486		100	DJ6TE	30	15
64	F5JP	474		101	DK7SN	30	15
65	PA0GBE	468	47	102	PA3ATP	18	9

70cm SECTION B (SWL)

1	ON1KVJ	1082	251	5	NL6033	221	58
2	BDXC1450	589	87	6	NL4775	151	58
3	ON1AUR	508	93	7	PD0AQO	124	65
4	ONL4867	347	76	8	DC8ZW	81	27

23cm SECTION.

Posn	Call	Points	Best DX (km)	Posn	Call	Points	Best DX (km)
1	F1ETG	3860		9	F1ZI	864	
2	DJ4LB/A	3392	84	10	F2RP	862	
3	F1BJB	2852	115	11	DL3CZ	636	47
4	F8MM	2780	115	12	DF5XJ	224	23
5	F3YX	2736		13	PE1CSI/A	172	15
6	DL4FAE	2712	84	14	DL5NQ	172	14
7	F6BEZ	1344		15	PA2AAD/A	112	14
8	F6FGE	1176					

23cm SECTION B (SWL)

1	DK3QA	105	80

3cm SECTION.

1	PA0GB	384	19
2	PA0JKW	304	19
3	PA0HMV/A	80	5

The BATC activity contest 1981 which took place earlier this year has proved very popular indeed and the level of activity was exceptional. Several stations have asked if another similar contest could be held in the autumn. Some also have expressed an opinion that perhaps seven contest days is too many and that five would be a better number. What do you think? Please let me know your views which should be sent to: 18 Church End, Milton Bryan, Milton Keynes, Buckinghamshire, MK17 9HR.

73,

GRAHAM SHIRVILLE G3VZV

N.B.T.V.

The latest issue of N.B.T.V. Magazine continues the article on a hybrid camera-monitor by David Sumner G3PVH.

An interesting article entitled 'TV Without Lines' by A.O Hopkins discusses the merits of an early TV system which didn't use the now conventional line scan system.

The magazine also gives details of a solar cell head amplifier and video processor for N.B.T.V. systems. A photo-cell amplifier using a LH0042 integrated circuit is also described by A.J Quinton. All the usual letters and news items are also included in the magazine as is the 'Photo News' page.

Doug Pitts' address is;

1 Burnwood Drive,
Wollaton,
Nottingham, NG8 2DJ

CONTEST CHAOS

Abridged.

Paul Surtees G8OVX

I am not involved in any aspect of electronics professionally. I am in fact in the building business so whilst I cannot take my poachers coat to work and return with pockets stuffed full of components, I can lay my hands on other items which are useful for /P operation such as a large van, matching trailer in contrasting colour (?), a generator just about man enough for the job, and a seemingly unlimited supply of aerial mast sections (scaffold poles).

To make the best use of everything at my disposal, the electronics were built into the van in the two days preceding the contest and the trailer drilled to accept guy wires. Two scaffold poles, one fitting nicely over the other, were chosen to support the aerial. The potential height above ground being 40ft. The 2 meter aerial was a 10-X-Y and the 70cm aerial a 46element Multibeam which was collected from AMCOMM on Friday. Alex, (the boss) very kindly let me take a reel of UR67 with instructions to cut off what I need and return on Tuesday with the rest and pay him then, how helpful can you get? Come Saturday morning all the equipment was at my place of work awaiting final testing.

9.00AM local time Saturday:

Started loading gear onto trailer. Load consisting of masts, aerials, ladder to get up there, jack and building blocks-so we can get trailer off the wheels to stop it swaying on the suspension, odd bits of wood for leveling same, generator, lots of diesel, lots of soap and water-dirty job this, also last minute touches to van like wiring in mains stabiliser, wire in internal lights and caption camera, borrowed the night before. At this point the lads and I had set ourselves a target time of 12.00AM to arrive at Bushey Heath and were supremely confident that we would make it.

11.00AM: Loading finished, started van.
11.05 started van again.
11.07 and again, and again .....
11.15 After much tinkering and rolling about under van decided that there was water in the diesel tank and considered applying for a detectives job.
11.45 Finished draining and bleeding fuel system, got van running smoothly.
11.50 Coupled trailer to van, washed hands and headed home for change of diesel-soaked clothes.
12.00 Arrived home and realised we were not going to make our e.t.a. (elementry Watson).
1.00PM Arrived Bushey Heath (ZL39H 400ft a.s.l. and welcomes careful drivers) and had a beer to celebrate. Picked a nice spot. Avoided contraceptive on ground nearby. (wish I had a low-light camera for later).
1.30 Started to erect aerial.
2.00 Find that some nuts have vibrated off clamps and dispatch one person to purchase new ones. Have a beer while waiting.
2.45 Person returns with necessary hardware thereby interupting drinking, reluctantly get on with erection.

3.00 Major policy decision reached.
Decide to settle for 30ft of mast instead of winding it up to it's 40ft potential since it's me up there and I don't think fourteen stone belongs 40ft up a scaffold pole.
4.00 Aerial erected and guyed, everything ready to go, wind starting cord onto generator, pull and..... nowt! And the second time, and the third..... bloody water again!
4.45 Finished bleeding system (you can read that two ways-both of which are correct!), faced Mecca, knelt on a carpet tile (best I could do under the circ's), said three Hail Mary's and pulled starter cord.
4.50 People start complaining about generator noise. Have a beer to drown sorrows.
5.00 Test everything. Out of the three cameras only one works properly. Promptly dismiss any notion of having separate inside/outside/caption cameras. Have a cheese sandwich to celebrate. At this point my helpers leave for the day having more pressing commitments and not wishing to get breathalysed on the way home. Both promise faithfully to return tomorrow to help me dismantle the station. Don't like the way they smiled when they said it.
5.30 Alone! Radiate test card and get a couple of encouraging reports.
7.03 Contest starts. Work G8EIM 1 KM away, celebrate in usual manner.
9.10 Everything going fine when tuner starts playing-up. Spend next hour finding dry joint.
10.05 Working G4FUZ when selector buttons on varicap unit decide to become intermittent and very sensitive to touch. Spend much time wedging paper in the right places. Hear a couple of stations that I might have worked if it wasn't for this trouble. Realise why so many people work repeaters.
10.55 Everything fine again. Work G8LES and get some really great colour pictures from him. Get rather annoyed when I hear G4CRJ just down the road working G8PTH in Canterbury. How come he can hear him and I can't?
11.30 No new stations about so watch some BBC2.
12.45 Nothing doing, decide it's time for bed. Pop outside to switch off generator and notice car parked beside me with defective shock absorbers. Also notice guy on motorcycle with hand portable. He doesn't identify himself so I assume that he is another 'squeaky' or 'good buddy'. Back inside and wire doors together just in case!
7.00AM Sunday morning.
Arise and notice two parked cars nearby with sleeping occupants. Decide not to start generator until 8.30, but it's such a nice day they really shouldn't miss it.
8.30 Generator started on second attempt, can't face a beer so have sandwich to celebrate.

Uneventful morning.

1.00PM contest ends and no sign of my helpers. Time to watch Police 5 and reflect on the weekends activity. Shaw Taylor shows a photo-fit picture that looks like someone I worked yesterday.
2.15 Wonders never cease! Helpers arrive-must be closing time. Dismantle station without disaster and head for home. I wonder why those cars spent the night on top of a hill!

COLOUR VISION MIXING

John Goode.

As the PAL colour TV system is 'compatible' with the 625 - line monochrome system, one would think that a well - designed black and white vision mixer would be suitable for colour signals. Unfortunately, it's not quite as simple as that. In one sense, most monochrome mixers are 'compatible' with colour signals - if you put a colour signal in, it comes out alright - but in black and white! This is usually due to the fact that the mono' signal processing removes the colour burst signal, causing the colour killer to operate in any subsequent decoder. See fig.1.

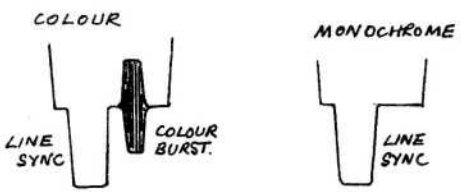


Fig.1.

From the above, it can be seen that a colour mixer needs different signal processing from that of a mono' mixer. Additionally, it is necessary to equalise the signal delays through the different paths that can be selected through the mixer. Of this, more will be explained later in the article.

Typical arrangements for synchronising monochrome setups are shown in figs.2 & 3.

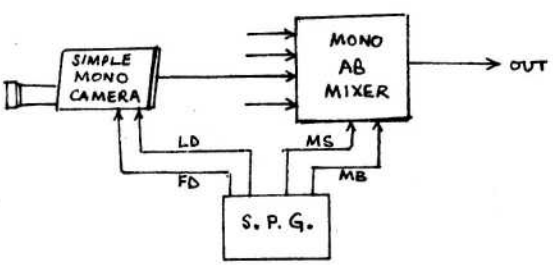


Fig.2.

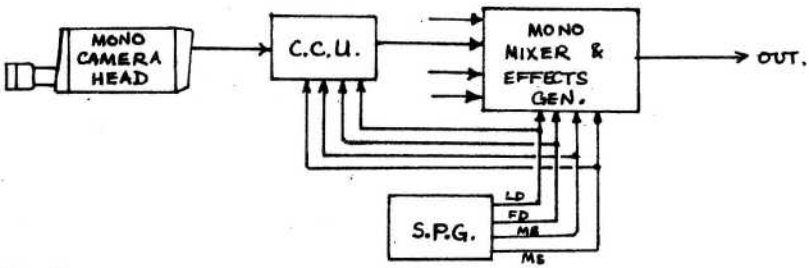


Fig.3.

As can be seen, it is quite common for each source to be synchronised by either two or four Sync Pulse Generator drive signals, and for the vision mixer to re-insert syncs and blanking direct from the SPG. This type of arrangement is far less common with colour setups, as most cameras capable of external synchronising are 'gen lockable', allowing 'single wire' locking. This is much more convenient than supplying line drive, field drive, mixed blanking, mixed syncs, burst gate, video axis (PAL) switch and sub-carrier to all synchronous sources. Nevertheless, it will be necessary to supply these seven signals to any seperate PAL coders in the system. Therefore, a colour system might be as shown in fig.4.

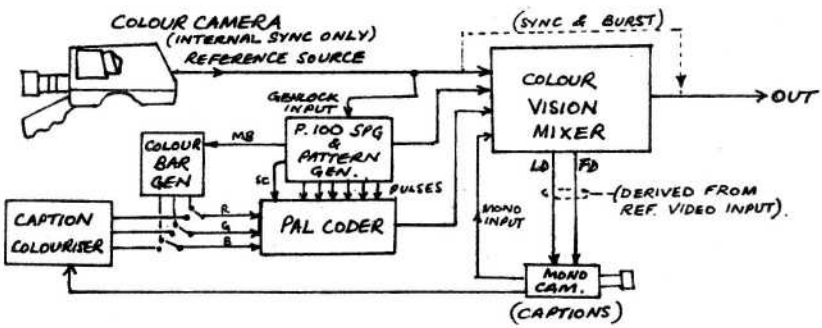


Fig.4.

From fig.4 it can be seen that the vision mixer derives its syncs from the 'reference' input signal, all other sources being either directly or indirectly genlocked to this source. Sync and burst is gated from the reference video signal and re - inserted at the output processing amplifier. However, because in the NTSC and PAL colour systems instantaneous transmitted hue is represented by the instantaneous relative phase relationship between chrominance and burst signals, it is essential that the paths taken by the video and reference signals

have identical phase - shifts. Another way of putting it is to say that the signal transition time must be the same for both paths. The surest way of doing this, without the use of expensive delay lines (and vectorscopes to adjust them), is to arrange for all signal paths and the burst (ref) path to pass through similar circuitry.

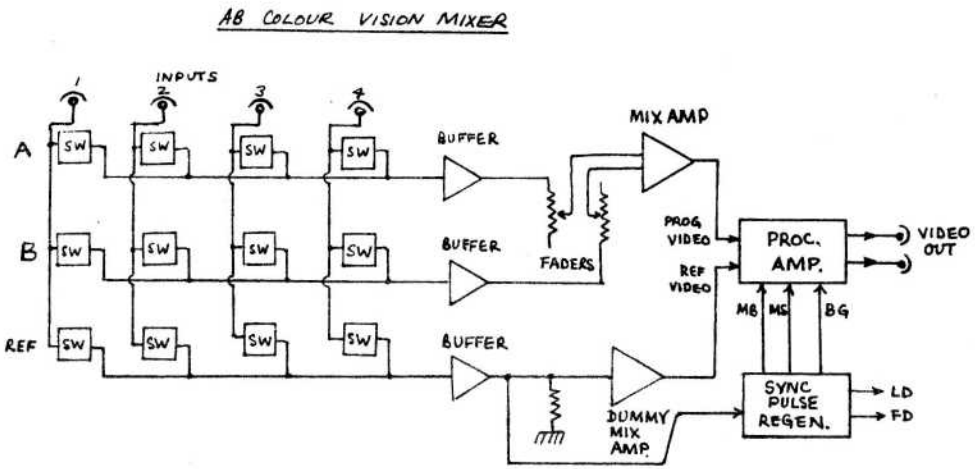


Fig.5.

Consider fig.5, the block diagram of a simple AB vision mixer. Four inputs are shown, with some form of electronic switching. This will almost certainly be necessary, as achieving good isolation at sub - carrier frequency with mechanical switching is virtually impossible. Consequently, similar switches are used for the ref. source selection, in order to ensure identical signal delay. However, whereas interfield switching would probably be provided for banks A & B, a simple rotary selector switch would suffice for the reference source. A dummy fader and mix - amp' is also included in the ref. path, thereby ensuring that the video and reference signals arrive at the processing amplifier inputs having suffered identical delays.

From the above, we can formulate the "Golden Rule";

THE AIM IS TO GET THE REFERENCE VIDEO AND THE PROGRAMME VIDEO, (WHICHEVER PATH IT HAS FOLLOWED), TO ARRIVE AT THEIR RESPECTIVE PROC. AMP. INPUTS HAVING SUFFERED IDENTICAL DELAYS.

A popular configuration of vision mixer among commercial manufacturers is the 'ABC' mixer and effects generator. Wipes and mattes are performed between banks A & B, which are then combined with bank C in the mix stage. In fig.6a, it is shown in its mono' representation, and then in fig.6b with equalised path delays.

As can be seen from fig.6b, not only is it necessary to use "dummy" circuitry in the reference chain, but also in the C path, in order to equalise the delay with respect to the A & B paths.

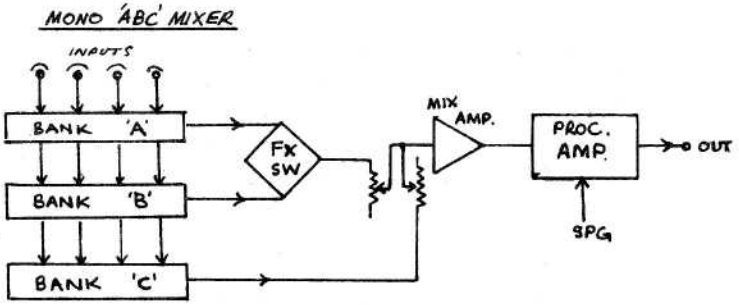


Fig.6a.

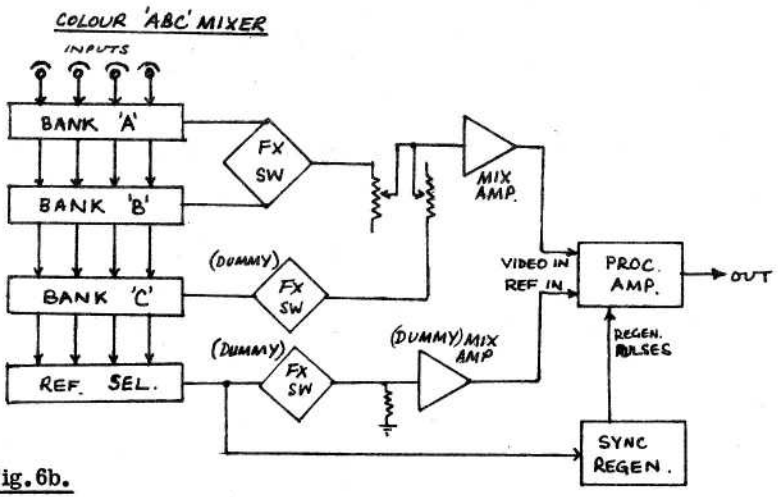


Fig.6b.

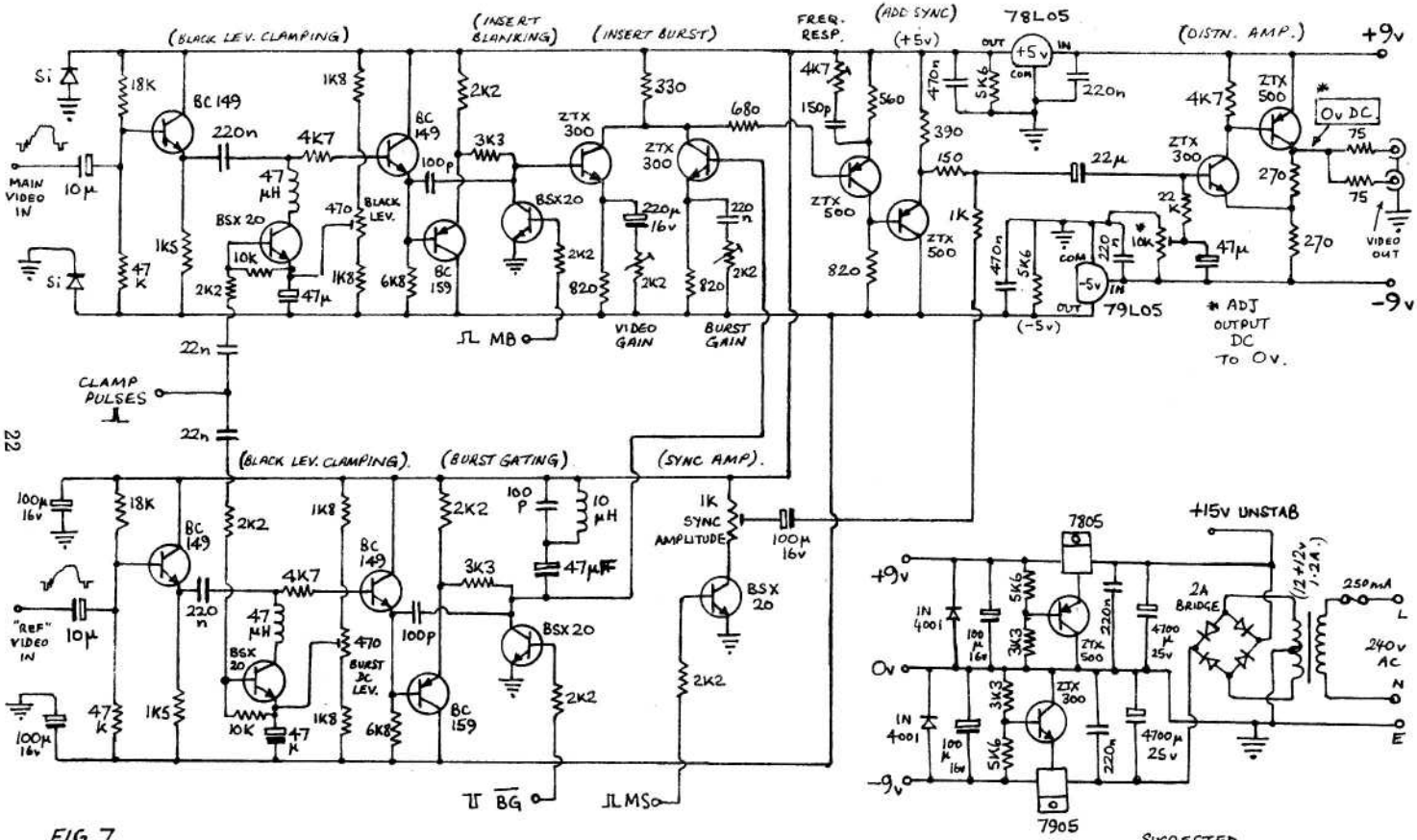


FIG 7

COLOUR PROC. AMP.

FIG 8A SYNC CIRCUITS

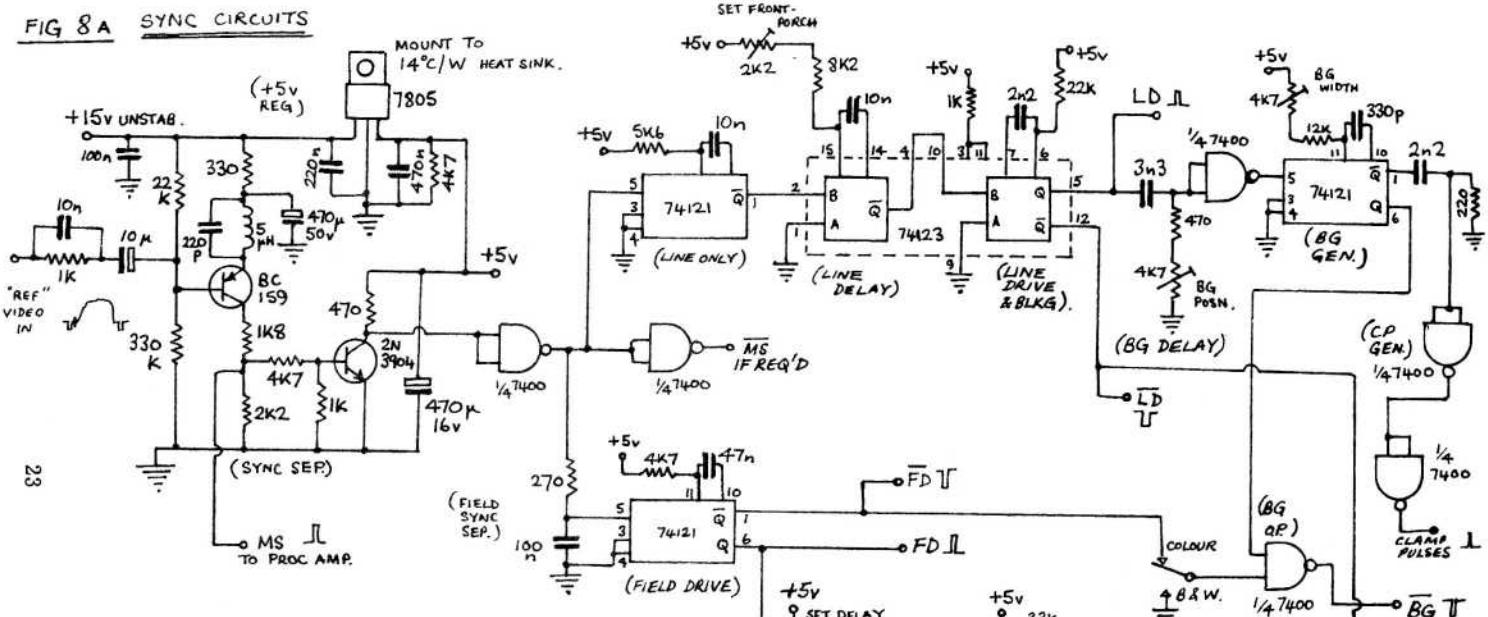
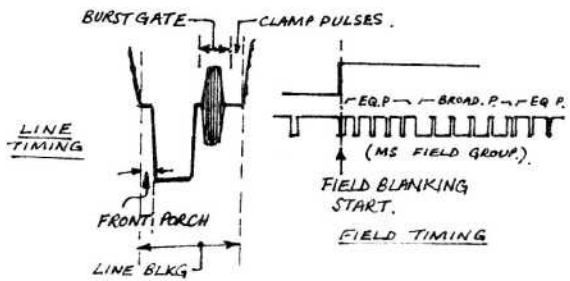


FIG 8B SYNC. REGENERATION.



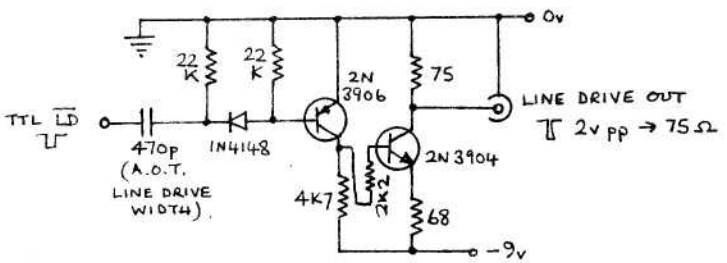
Enough of principles then - now for some circuits. The key to any type of mixer is the processing amplifier and sync regeneration circuits. The proc. amp. circuit is shown in fig.7, together with a suitable power supply.

The operation of the circuit is as follows: Both video and reference inputs are clamped and buffered by complimentary emitter - followers. The video is then blanked by a BSX20 'chopper' transistor, whilst the reference chain uses a similar circuit to gate the burst signal. Video and burst are then combined in the following collector - mixing stage, which is next amplified, inverted, and HF correction applied. Re - generated syncs are added, and the output is fed via a distribution amplifier. Two outputs are shown, but this can be increased to three if required.

Lastly, fig.8a shows the sync regeneration circuits, with line and field drive outputs (suitable for driving a mono' camera) in fig.9.

Referring to fig.8a, in order to regenerate blanking signals having leading edges in advance of line and field syncs respectively, it is necessary to incorporate delay monostables, and these must be adjusted as part of the setting - up procedure. The other adjustments are for setting the burst gating signal, and fig.8b illustrates these timings.

I hope that these ideas are of use to members. Even if colour is not contemplated at present, a mixer built to these principles will represent one less piece of equipment to convert when the 'plunge' is finally taken. It should also be pointed out that equalising path delays through mixers, whilst being essential for colour mixing, is, strictly speaking, the correct practice for monochrome mixers too. It's just that for amateur use we are prepared to accept the slight horizontal errors that are the result of these delay inequalities.



pulse outputs

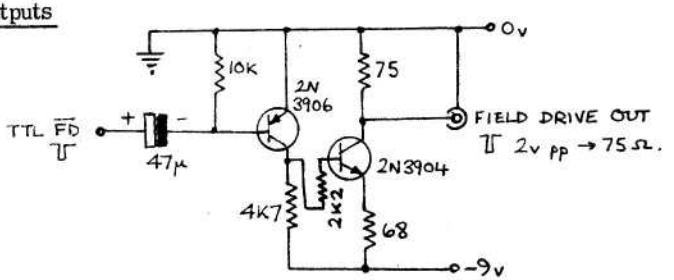


Fig.9.

HANDBOOK NOTES

This is an occasional column and will be expressly concerned with articles and projects which appear in the new 'Amateur Television Handbook'. The column will give information on corrections and alterations to the text and drawings, also details will be given on any modifications, application ideas, test and set-up procedures additional to those published in the handbook and any other items which are relevant.

Firstly, as is inevitable, one or two minor errors have crept into the book, these are listed below;

V. The acknowledgement to Wasco Electronics should have shown them to be in Lancaster.

21. Details for the coils for the Amateur Television Receiver are;

L1. 12t 26 swg on 4mm former.
L2. 6t 26 swg on 4mm former.
L3. 4t 26 swg on 4mm former.
All close wound with core.

27. The 100uF electrolytic capacitor in the base of the third BC107 is shown the wrong way round. The + should go to the 820 ohm emitter resistor.
57. Pin 1 of the bottom 74150 IC should be connected to ground.
76. The 10uF capacitor at the top centre of the board should be 100uF.
87. TBA520 IC, pin 1 should be pin 2, pin 6 should be pin 5 and pin 7 should be 6.
88. RV2 should be labeled 'burst phase'.
91. C10 is not shown and should be drawn between the two dots just below R74.
R78 adjacent to RV6 and RV8 should read R79.
C27 is shown as an electrolytic. It is not.
C12 is shown as un-polarised, it's positive is at the R42 end.

All printed circuit boards are designed to use standard ISEP edge connectors manufactured by ITT. These are the 33 way fabricated male No.12-210-001 and the 33 way fabricated female No.12-300-021. There are two types of ISEP connectors but the other (more expensive) ones would be much more difficult to fit.

East Cornwall Components of Wem, Shropshire, SY4 5PU can supply these connectors at £4.29 for the male and £6.10 for the female, plus 20p postage plus VAT.

A more economical connector is being sought.

The P100 sync pulse generator will supply all the necessary sync signals required for designs in the book. This unit is also board size and edge connector compatible with the book project PCBs and will fit nicely into a card rack system.

Be sure that the 12 volt supply to the PAL coder is very well regulated otherwise problems in the colours may result.

All plug-in printed circuit boards are of a standard size viz; 112mm x 177mm.

TV ON THE AIR

COMPILED BY ANDREW EMMERSON, G8PTH

Lots of news and not so much space - so please excuse the close print and read on ...

Well, what an opening! I refer of course to the period from Thursday night 29th January to Sunday 1st February, which in my (limited) experience was the longest continuous lift and the first arranged to coincide with a contest. For me it was remarkable that even during the middle of the day it was possible to make DX contacts (e.g. to PAoYG near The Hague at 2pm on Saturday 31st January). It appears that much of the enhanced propagation was due to surface ducting, with diversity reception conditions. Thus at a time when ON1ADK was coming in at G4IMO (Canewdon, Essex), only 25 miles away, on exactly the same frequency and beam heading, DBoTW was visible here at Blean.

Ray GW8GKF made some good DX contacts, e.g. to G8MBI near Southend in Essex, Brian G8DTQ was seen at G8CJS in Leeds, and as I mentioned, the German crossband repeater DBoTW came in at strength P1 on two nights here at Blean. The last is all the more remarkable because DBoTW has an output of only 20W on 70 cm (it must be a menace to local contacts!). Low power was indeed no hindrance to making DX contacts, at least in the absence of co-channel QRM which was, of course, a problem at times. ON5VG in Brugge managed to be seen here using just 2 watts, and no doubt many similar stories could be told. Needless to say there were some displays of bad operating procedure particularly from newly licenced stations - under lift conditions the rule is once you have made the contact switch off and let someone else have a go, not show interminable videotapes of the shack or leave up a card saying CQ-TV all night long. Pathetic wallies who thought it was clever to work the French repeater (and jam it up for legitimate local stations) succeeded in making 144.75 unusable at times in southeast England - perhaps it was excusable that we used 145.350 as a local co-ordinating frequency by way of retaliation! (Fortunately even quite a few F-stations ignore repeater users and continue to use 144.75 as the TV calling frequency; their 'bandplan' TV calling frequency is 144.17 any mode.)

If you'll forgive a little more self-indulgence I must mention how pleasant it was to work F-stations for the first time. The opposite modulation sense made no problem in identification since the signals were so strong and the French TV ops were extremely keen to assist in optimising contacts since it was just as much

a novelty for them. The more enlightened French stations (like F1FKP and F1EDM) could run both positive and negative modulation and I was delighted to receive noisy but lockable SECAM colour from F1EDM at Le Havre.I don't know whether this is a 'first' but I guess it is. From a French point of view we British stations are low in the band: they are used to picking up nothing but 438.5 and many have crystal controlled converters. Such was the enthusiasm to work G-stations that one F-station even rebuilt the lines in his converter during the day in order to receive us properly the following evening.

Talking of high and low positions, the considerable QRM from SSB stations underlined how useful it was to be able to move away from the 434 to 436 region. G8EQZ and G8SUY have already modified their TXs (see article in last issue) and used 437 MHz to great advantage. About half the Dutch stations are high in the band nowadays, too, as a result of official band planning recommendations. Their video carrier is 439.25 with 5.5 MHz intercarrier sound and the colour subcarrier below. In practice this causes no reception problems, though on the transmit side it does need some neat filtering to knock off the upper sideband. PAoYG explained visually how he used a two cavity bandpass filter (6 MHz wide) with two further cavities to notch out the unwanted upper sidebands of video and colour subcarrier. He also related he had been into colour for ten years now and his PA used the familiar German 2C39 design. Using 4CX250Bs in the K2RIW design would give more gain and power but at the expense of bandwidth. For the sound on 434.25 he used a separate transmitter and aerial system since he knew no mixer (or PA) sufficiently linear not to recreate a suppressed sideband. Any such device would have to possess - 60dB intermodulation (sorry, not very well expressed). This, of course, is the problem which has foxed people who run the DJ4LB transmitter, which produces all sort of nasties way outside the band when amplified. A final comment on ATV across the water would be that the pattern of activity is subtly different, at least in Belgium and Holland. Possibly due to the flatter terrain power is genrally lower and receivers deafer. (Reports tended to be 1½ to 2 points below expectation.) There seems to be far more homebrew equipment (less surplus commercial) and more activity!

Returning to this sceptred isle and indeed to royal purlieus, Gerry G8DXZ reports from Windsor that he is experimenting with FM video on 3 cm, using the Gunn diode and horn of a £5 burglar alarm unit. If this works he will then try FM vision on 23 cm. Progress reports are awaited. Some time ago I likened East Anglia to a black hole as far as ATV was concerned but I am pleased to report otherwise now. Mervyn G8TAD and Terry G3WDI are showing the flag in Lowestoft and Carlton Colville respectively. Both use the PC Electronics tx design. Further south at Martlesham Heath the radio enthusiasts at British Telecom's research centre are planning a TV tx for both local 'news' broadcasting and DX contacts to Holland, which are thought to be possible under most conditions. With the resources of their labs and TV research studios

results should be exceptional!

Other news in brief:

■ John GW3JGA at Prestatyn is giving talks to several clubs in the district and supplying transmissions every Sunday at 9pm. Several stations have built his design of receive converter.

■ Roel PAoJTA in Rotterdam sends details for his slow and fast scan equipment - he is QRV with ATV on 70 cm plus SSTV on 144.230 (mode A3J).

■ Israel Radio became the first international broadcaster to transmit SSTV pictures in a historic experiment on 2nd November 1980.

■ Try and get to the Sussex Mobile Rally at Brighton racecourse on Sunday 19th July. It's open 1030 am to 630 pm and there will be an ATV stand on the top floor near the bar again!

■ Following a VHS tape swap the BATC and Bristol Group ATV presentations have been transmitted on 438.5 from F1BJB in Amiens. Viewers were apparently impressed! The French tape in exchange is still awaited ...

■ The cumulative contest seems to have generated a helathy level of activity - which is just what it was meant to do. Many stations made 10 to 12 contacts on each contest night.

■ Graham G3VZV at Milton Bryan has discovered he can work G8DTQ (Caterham), G8VBC (Derby) and G3YQC (Rugby)two-way under flat conditions. Not bad going for the distance!

■ Activity in Beds. and Bucks. courtesy of G3VZV:

G3VZV (Milton Bryan) tx/rx 70 cm, rx 23 cm.
G4CPE (Luton), G4HGZ (Luton) tx/rx 70 and 23 cm, with intercarrier sound and
G3UDC (Bletchley) tx/rx 70 cm. (occasional colour.
G4FAK (Cranfield) tx/rx 70 cm, rx 23 cm.
G4FUZ (Watford) tx/rx 70 cm. Plus four very active rx only stations.

■ Repeater news: With G4CPE and 'HGZ now transmitting on 23 cm they are keen to get GB3TV licenced. This will be in the Luton area and an inband 23 cm machine. G4CPE has designed a simple downconverter from 23 cm to channel 36 built into (and using the local oscillator of) a standard UHF varicap tuner. Details soon in CQ-TV.
An application for a TV repeater serving Stoke on Trent and district (GB3UD) is currently with the Repeater Working Group. It would be sited at Mow Cop just north of Stoke and most of the hardware has already been purchased.

■ News in of other activity around Stoke - G4DHO, G4DVN, G8GFQ, G8KUZ, G8JMJ plus plenty of rx only stations form the hive of activity in this neck of the woods. Most station transmitters are DJ4LB and run 80 to 100 watts peak sync using Microwave Modules solid state linears. That's what the letter said, so please let us know how you did it - comprehensive modification details would be of great interest to many potential users of these amp-consuming devices. Regular activity

is on Wednesday nights from 8 pm and Sunday mornings after 10 am. Calling and talk-back is on 144.17 with most stations providing intercarrier sound. Duplex TV QSOs (70/23 cm) have been tried (G8GFQ - G8JMJ on 24.2.1981) and it seems there is a keen level of technical activity up in Stoke. Thanks to Steve G4DVN for sending all this information, also the data sheet on the 'JMJ vestigial sideband transmitter. How about getting him to send a sample to the editor for test and review?

This "TV on the Air" has been another marathon, and I am delighted that the news keeps flooding in. Don't keep quiet about the activity in your area, let evryone know what you are up to through this column. Your editor, John G3YQC, would be grateful for comments on whether you want to see this much news in every issue. For my part I think it's a good thing because it encourages more activity - I know that word keeps cropping up, but that's what this hobby is all about. ATV should not be an armchair pastime. But if you would rather see the space in the magazine used for something else, let the editor know - it's your magazine. In the meantime please send your reports to me, Andy Emmerson G8PTH . My address is 4 Mount Pleasant, Blean Common, CANTERBURY, Kent, CT2 9EU.

AMSAT - UK

The following letter has been received from AMSAT-UK;

'No doubt you and most of the members of your club have already heard of the loss of the latest OSCAR satellite on 23rd May, 1980. The cost to AMSAT was high, some 9 man-years of work, £40,000 in cash, £1,000,000 in hardware donated by various well-wishers and AMSAT groups world-wide. This equipment now lays at the bottom of the Atlantic Ocean off Karou (Devils Island).

This is an apeal for CASH from your members to assist AMSAT-UK to provide £40,000 inside ten months for the European Building Programme for the next bird to fly. The work team has already agreed that they will re-build and in fact have already commenced as of July 6th, 1980. Money however is what is required NOW.

Would you ask your members for a donation towards this project, however small or large. All monies received will be sent without administration charges to AMSAT-DL, Treasurer, as soon as received.

Please pay any amount in any form to: The Hon. Secretary, AMSAT-UK, G3AAJ, 94 Herongate Road, Wanstead Park, LONDON, E12 5EQ.

Please mark envelopes AMSAT PROJECT OSCAR and cross cheques "AMSAT-UK". Many thanks.

A new launch date is available early in 1982 IF we can get the new OSCAR built, tested and to launch site inside of twelve months. If every Radio Amateur in the UK gave the equivalent of one packet of cigarettes or a pint of beer, we would have half the money required.

The money is needed NOW.

G3AAJ
for AMSAT-UK PROJECT OSCAR
APPEAL.

* please mention BATC when sending contributions.

P100 COLOUR BAR GENERATOR

Trevor Brown, G8CJS.

This article describes a simple grey-scale generator for use with the P100 sync pulse generator and also gives a suggested circuit for a new colour bar generator.

Most simple grey-scale generators use a 7413 gate as a line-lock clock oscillator, it is made line synchronous by applying mixed blanking pulses to one input to stop the oscillator during blanking periods. A problem exists however because at the beginning of each line the first cycle is longer than the rest resulting in a much wider first bar. This problem can be overcome by making use of the clock signal appearing at pin 11 of the SPG.

To avoid spikes and glitches on the grey-scale waveform it is necessary that the counter be synchronous (ie. all outputs change at the same time). The counter used in this circuit is a 74193.

By convention a grey-scale should have the white bar on the right hand side whilst colour bars should have the bar of highest luminance on the left. An up-down counter type 74193 is used to reverse the waveform when necessary.

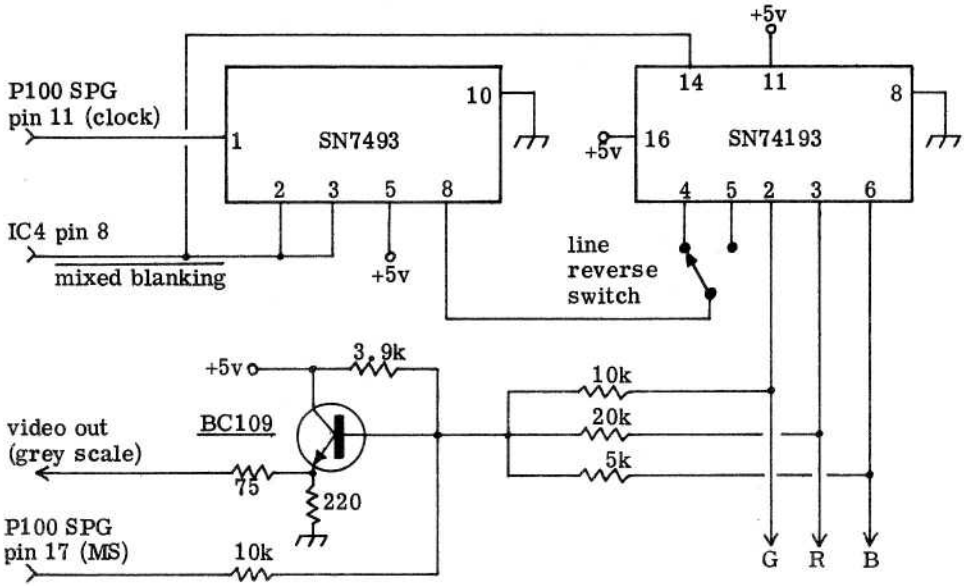
By using mixed blanking pulses to reset the counters the waveform produced does not infringe on the blanking period, by following the counter with a conventional digital-to-analogue circuit and a sync adder a 1v p-p composite video signal will be produced.

P.A.L. COLOUR CODER.

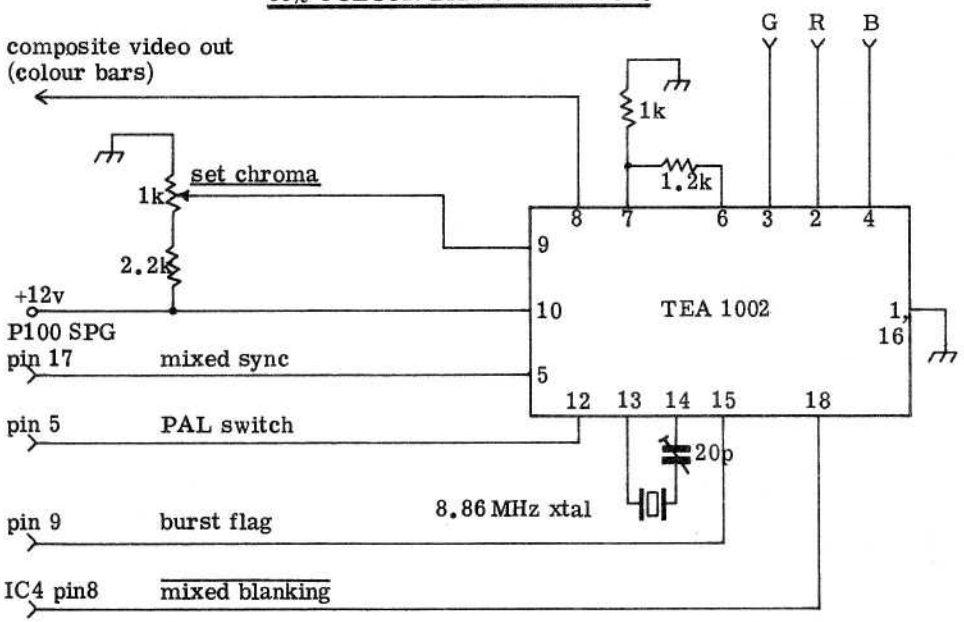
Later this year Mullard Ltd will release their single chip PAL colour coder type TEA1002. The RGB signals produced by the grey-scale generator are applied to the chip together with a crystal at twice the sub-carrier frequency.

The composite video signal at pin 8 should be applied to the usual emitter follower to provide a 75 ohm output impedance.

Unfortunately, at the time of writing I have not been able to obtain a chip to try so the circuit given has been made up from details given in the application notes. It is hoped to build and prove the unit as soon as the TEA1002 becomes available.



95% COLOUR BAR GENERATOR.



M.S.T.V. report

The following is taken from the 'Medium Scan Television' newsletter from W9NTP. Jan. 1981.

The Special Temporary Authorisation (STA) permission from the FCC which has been in effect from 1978 has been renewed by the FCC for an additional two year period. The original five amateurs plus one additional one have been given permission to transmit MSTV on 29.150KHz with a maximum bandwidth of 36KHz. These six amateurs are: W0LMD, W9NTP, WB9LVI, W3EFG, W6MXV, N0AB. During the two years additional amateurs can be added to the list. Each case will be considered by the FCC when permission is requested. I will be glad to assist anyone to prepare a request.

Mathematical analysis shows that the maximum field rate that can be used for MSTV under these bandwidth restrictions is two fields per second for a 128 pixel by 128 line television picture. This results in a base video bandwidth of 16KHz. One exception to this is the use of wideband single sideband, this will be considered in due time when a source of suitable filters is located.

Since the last newsletter various motion formats have been tried in the laboratory and some of the best ones have been chosen for further test. These tests have shown that if the full raster is transmitted that it is necessary to have an efective field rate of at least 7.5 fields per second to give the illusion of reasonable motion. The 7.5 fields per second can be easily achieved by field grabbing at one eighth of 60 fields per second. The base bandwidth of such an image is 64KHz which is far beyond the capabilities of the allocated 36KHz RF bandwidth.

Some years ago one of the MSTV investigators, W3EFG, developed a bandwidth reduction system called 'Sampledot' for his employer, General Electric Co. at Valley Forge, Pa. The scheme was demonstrated in various mechanisations for several years. Sampledot works on the principle of only transmitting a fraction of the total number of pixels during any fast scan (60Hz) field time. The chosen pixels for transmission are sampled from many small areas that are repeated many times throughout the total field time. The samples are sampled in a pseudo random fashion to reduce any repeated lines or edges that could result in even sampling times.

The result is that since each pixel is not transmitted every time the original field is scanned, the chosen pixels can be stretched in time or 'boxcarred' to reduce the base video bandwidth. The total number of pixels will be sampled after many pseudo-random passes through many different 60Hz field times. The effect is to give continuous motion on a one field pass basis but to include many passes so that the image viewed by the receiver will show a constant update of new dots.

Recently in the Navy laboratory where various forms of adaptive picture bandwidth reduction was being tested we set up the old 'Sampledot' scan-converter which had been converted to be a field grab system for comparison. In addition other digital scan converters were available to make it possible to demonstrate both Sampledot and field grab simultaneously. Remember that W3EFG allways used real-time television at 60Hz field rate for his Sampledot image. The use of a digital scan converter makes it possible to use other field rates for further bandwidth reduction. These two scan converters were coupled together to allow the demonstration of a Sampledot image derived from a 7.5Hz field grab image. The image that viewers liked in terms of minimum bandwidth was a 4/1 Sampledot image at a field rate of 7.5Hz. This gives a potential bandwidth reduction of 8 x 4 or 32. When divided into the 60Hz field rate of the source television it results in an effective field rate of 2 fields or a base video bandwidth of only 16KHz, (our objective for a transmission capability of 36KHz RF bandwidth). I might also say that we are still discussing a low resolution image of 128 x 128. Eventually we feel that the image should be 256 pixels by 128 lines. This means that the base bandwidth will be 32KHz. If it eventually works out to use wide-band single sideband, the system of field grab Sampledot will work out very well. Remember that no one has built this system yet. The construction is quite simple if you own a 2-memory Robot 400. Read Jan 1981 QST for how this can be accomplished.

PCBs

The following printed circuit boards and components are available from club sales:

'AMATEUR TELEVISION HANDBOOK' projects.

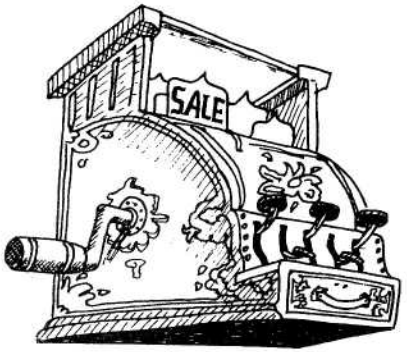
Wide-band 70cm tuner PCB		£3:00
Amateur television receiver PCB		£1:50
Electronic character generator PCB		£3:00
Character generator memory PCB		£3:00
Colour test card PCBs (set of 3 double sided)	p&p 50p	£15:00
Horizontal aperture corrector PCB		£3:00
Video switching unit PCB		£3:00
P.A.L. colour coder PCB		£3:00
ALL ABOVE PLUS 25p POSTAGE.		
74S471 PROM. pre-programmed for colour test card		£10:00
TMS4036 memory IC for character generator memory		£5:00
BOTH ABOVE PLUS 20p POSTAGE.		

PROJECT 100.

Sync pulse generator PCB	£3:00
Pattern generator PCB	£4:50
5MHz and 4 fsc crystals, each	£2:75
ALL ABOVE PLUS 25p POSTAGE.	

Mr.C.G.Dixon (BATC club sales). 'Kyrles Cross', Peterstow, Ross-on-Wye, Herefordshire. HR9 6LD.

Would overseas members please allow sufficient postage or send for quote. Cheques should be for UK banks only please.



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Full page (inside) - £18.
Smaller displays - proportional.

Advertisements are placed in this column free of charge to paid up members. An address label from a recent CQ-TV envelope should accompany your ad.

FOR SALE

MARCONI I.O. camera and monitor, with PSU and leads.
C.Tranter, G8NTO 01-590-3993.

1" VIDEOTAPE, mostly Sony V12 on Sony spools. Suitable for EV320 series. 50min per spool. Little used. Reasonable quantity at £5. per spool or offers.
G.Vine. 132 Coppins Road, Clacton-on-sea, Essex. CO15 3LA. 0255-29345

ONE MULLARD A66-120X 26" colour tube complete with scan/convergence assembly, metal screen/degaussing coils. Bought new for previous 'Television' mag. colour project. Little used. £50. or offers. Will deliver within reasonable distance. Tel: 021-706-7384 after 6pm or; 772-2361 ext. 2464. G.Hankins G8EMX.

VISION SWITCHER PCBs, ex-broadcast $9\frac{1}{2}$" x $7\frac{1}{2}$" with socket, 40 video cross-points, 20 video i/p's, 2 independent o/p's, cut in blanking. Ideal basis for vision mixer. £12.
Plumbicon and Leddicon camera tubes, almost perfect, low hours, £15. Just the job for SSTV or colour camera.
A.McMurtry, GI3MBB. 20 Towerview Crescent, off Ballymaconnell Road, Bangor, Co.Down.

AMPEX VTR 5103, working, with tape. £80.
Marconi V320 modern studio camera with viewfinder and manual, £150.
Pye Lynx TV camera, £25.
Shibaden SV610 VTR and tapes, £100.
WANTED. Ampex VPR 5000-7000 capstan servo circuit diagram.
Tektronix 647 scope manual or circuit diagram. Will pay for the above info.
A.Cusworth. 25 Cowper Crescent, Leeds, LS9 7AT. Tel: Leeds 496048.

DOES ANYONE have a use for 405 line only receivers? Cossor 937, KB QV20 'Queen', RGD deep 17, the ancient circuits for these and others available.
Complete manual for EMI portable tape recorder type L4.
Transformer ideal for linear PA. 675v, 500v, 0 x 2 (total KVA 0.4) Primary 240v 50Hz. £4.
WANTED. Information, circuits for miniature oscilloscope CT52 (part of AP 68622), and Ultra Valiant transceiver (tuned for 160MHz).
M.Bonner. 2 Byward Avenue, Feltham, Middx. Tel: 01-890-0444.

SHIBADEN colour video recorder takes $\frac{1}{2}$" tape, needs service and new heads. £100. G8LES Tel: 01-398-4618 (evenings)

GRAND SALE.
14" EMI solid state picture monitors.
14" Petto Scott valve monitor.
25" Philips monitor, hybrid.
19" Rank Bush Murphy COLOUR monitor, hybrid.
All above cheap! please phone for prices.
Pye COLOUR telecine camera 4"x1¼" Plumbicons, reduced to £175. ono, has problems.
Pye Mk6 Image Orthicon studio camera, broadcast quality, 625 line. £75.
EMI I.O. studio camera, complete system with all kit, 405/525/625 line. £99.
3" Image Orthicon tube, elcon target, last one, snip at £15.
Vidicon scan coils, new, for solid state circuits. Takes 1" tube. £3 +75p p&p.
16mm lens for 2/3" tubes. No iris, as new £9 inc post.
Set of 4 lenses in transit case for turret cameras with TV88 mount. £60.
Marconi SPG. Dual construction, 405/625 line, solid state Mk 4 style. £15.
Pye UHF RX type 450(U) solid state, mains or 24v 19" rack mount. £10.
Vision mixer by ABC.TV. 8 inputs, A,B,C,D banks plus effects. Please phone for details.
Studio or OB talkback equipment, big pile of amps, speakers etc. Cheap.

WANTED:
PYE SPG module, system 70 (ISEP) unit No 2. £5. paid.
BBC white unit GE6/504 Black gen. £5. paid.
10" dia roof extract fans by Vent-Axia, with cowels for outside broadcast van.
Marconi automatic slide changer 6228 (Mk4) slide carrier needed and circuits.
Handbook for DYNAMCO 'SCOPE D7100 mainframe, 1 X 2 TB, 1 Y 2 Yamp, 1 Y 4 Yamp, £20 paid for Dynamco manuals in good condition.
Handbook for Avo valve tester also MN6M/504 vectorscope.
Automatic voltage regulator for MCR21 OB van, correct type with two Nipan plugs on top.
Information relating to or location of MCR22 and 24 or any interesting OB gen.
All the above: B.Summers.
13 Church Street, Gainsborough, Lincs.
Tel: 0427-3940.

NEARLY 30 stations are now using the PC ELECTRONICS ATV transmitter. It puts out a clean 10 watt signal on 70cm and is extremely compact. Just connect up camera, aerial and 12-14 volts DC and you're transmitting ATV. No hassles trying to convert something which wasn't designed for TV, a guaranteed 8 MHz bandwidth and the confidence of using proven technology. It's yours for £86.50p
Please send large SAE for full details to; BLEAN VIDEO SYSTEMS. (G8PTH)
4 Mount Pleasant, Blean Common, Canterbury, Kent. CT2 9EU.

CINTEL 28881 21" B/W monitor, with manual, works well. £10.
Telequipment D43R dual-beam 'scope with; 2 type G gen purpose and differential amplifiers. 1 type C high-gain (up to 100uV/cm) amplifier. T42 timebase 0.5us to 5 sec/cm with single shot facility and comprehensive TV triggering. With manual. Works well but needs just a little attention hence only £90.
'scope/monitor trolley. Two sloping shelves and horizontal lower shelf. Built like a tank! £6.
M.Lee. 34 Beechwood Avenue, Kew, Richmond, Surrey. Tel: 01-876-4379 evenings.

PHILIPS EL3402 1" VTR with manual. £100. o.n.o. Buyer Collects.
Worthing 39768. C.Kentch G8GPZ.

ICOM IC215 1W/3W FM portable 2M transceiver. Excellent condition and working order, R0/9, S20,21,22,23. plus 144.75 and 144.725MHz, (ATV calling). C/W handbook, nicads (no charger). £90. J.Wood, G3YQC 47 Crick Road, Hillmorton, Rugby, CV21 4DU. Tel: 0788-846220.

BOLEX H16 non-reflex 16mm cine camera c/w 25mm & 75mm lenses, tripple turret, case, multifocal viewfinder, cable release, filters etc. Bell & Howell magnetic record /optical 16mm movie projector. 2000ft spools, two lenses, circuit, superb condition and working order. c/w external speaker and transformer, leads etc. No reasonable offer refused for the above (need the space) or ATV exchange W.H.Y?
J.Wood. G3YQC 47 Crick Road, Hillmorton, Rugby. CV21 4DU. Tel: 0788-846220.

TWO SONY video recorders type 2100 ACE, one works manual plus 20 tapes. Offers please to A.Harada, G4INX, 132 Sealand Road, Chester. CH1 4IG.

PETO SCOTT $8\frac{1}{2}$" monitors: £15 each. British made for ITT, DC to 10MHz 'scope, transistorised, very compact. Would make ideal waveform monitor. With probe. £55.
D.Wilson. 4 Harkness Close, Bletchley, Milton Keynes, Bucks. MK2 3NB Tel: 0908-641234.

UNUSED new display unit containing two 5FP7A's, usual network of pots, scan and focus coils etc. Suitability of scan coils for SSTV not known. £35. Electronic video recorder EVR 1500, Hitachi with UHF 25/26 channel video and sound modulator. Scanning CRT, photomultipliers and electronics OK but no EVR film available. No mods made and in condition as purchased, (see CQ-TV 103). £40. Buyer collects. N.Smith, 31 Meadow Avenue, Wetley Rocks, Stoke - on - Trent, Staffs. Tel: 0782-550684.

MICROWAVE MODULES 28/432MHz 10W transverter. Excellent working order and condition. Had been modified for ATV (CQ-TV 104) hence one or two small holes in case, but now back in original condition. £50 o.n.o. or exchange WHY?
J.Wood. G3YQC 47 Crick Road, Hillmorton, Rugby, CV21 4DU Tel: 0788-846220

WANTED

Heavy duty pan and tilt head and tripod.
J.Aldebert, 8 Manse Road, North Mount Vernon, Glasgow. G32 0RA. Tel: 041-778-2978.

VIEWFINDER line scan unit (known as unit 6) for EMI camera type 207.
R.Rowe ZL1TFX, 1 Summit Terace, Hamilton, New Zealand.

FAST-TO-SLOW scan converter-DL2RZ or similar.
J.Harrison, G4AGW, 22 Gresham Road, London, E16. Tel: 01-476-7092.

CIRCUIT/INFORMATION on JVC TKC500 video switcher/effects gen'. All expenses paid.
M.Beddow, G8UBC. 45 Yelverton Rd., Radford, Coventry. West Midlands.

48el Multi/Para-beam or similar for 70cm ATV/SSTV. Also any circuit info on SSTV receivers. Please phone Graeme Caselton on Orpington 29230 after 8pm or weekends.

COPY of service sheets for Rigonda VL100M mini TV.
D.Pitt. 1 Burnwood Drive, Wollaton, Nottingham. NG8 2DJ.

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CAMERA TUBES	Price	Postage
EEV Leddicon	£ 82.	nil
½" E.M.I. 97777 Ebitron	£ 28.	nil
2/3" E.M.I. 9831 amateur grade vidicon	£ 12.	nil
1" E.M.I. 9677 amateur grade vidicon	£ 12.	nil
1" E.M.I. 9728 amateur grade vidicon	£ 12.	nil
4½" E.M.I. 9565 Image Orthicon	£ 10. for 2,	buyer collects
1" E.M.I. 9706 amateur grade vidicon (5" version)	£ 12.	nil
VIDICON SCAN COILS		
1" ex-industrial (limited number only)	£ 6.	£1.10p
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ACCESSORIES		
Paxolin sockets for 1" or 2/3" vidicons	0.32p	.14 p
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BATC headed notepaper & envelopes (50 sheets)	£ 1.75	£1.10p
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Please send orders to; Mr. C.G. Dixon (BATC club sales). Kyrles Cross, Peterstow, Ross-on-Wye, Herefordshire. HR9 6LD.

PLEASE NOTE THAT THIS LIST CANCELS ALL PREVIOUS ONES.

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Would Australian members please note that the BATC 'Amateur Television Handbook' is available directly from the Wireless Institute of Australia at the following address: P. O. Box 150, Toorak, Victoria 3142.

The price for the book is $4.60 plus postage.

This address is for handbooks only. All orders for other publications, Club sales items and membership subscriptions should continue to be sent to the UK.